

DOE-SC Review



SNS LINAC DIAGNOSTICS & CHOPPER

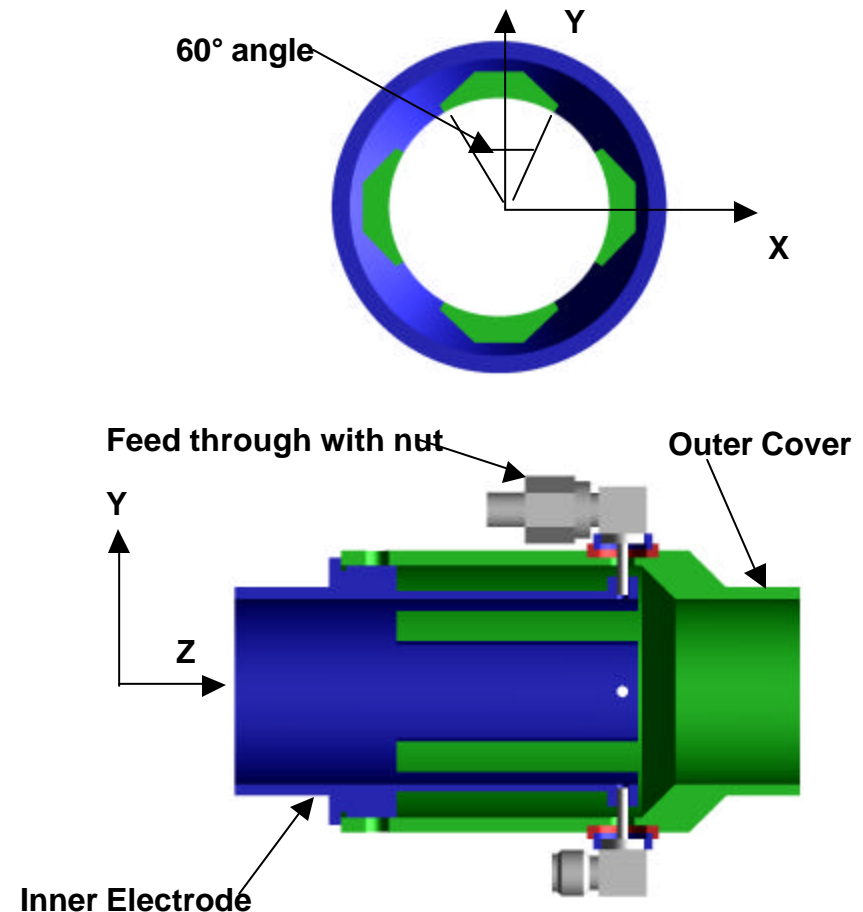
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Beam Position Monitor Developed for DTL Drift-Tube Insertion



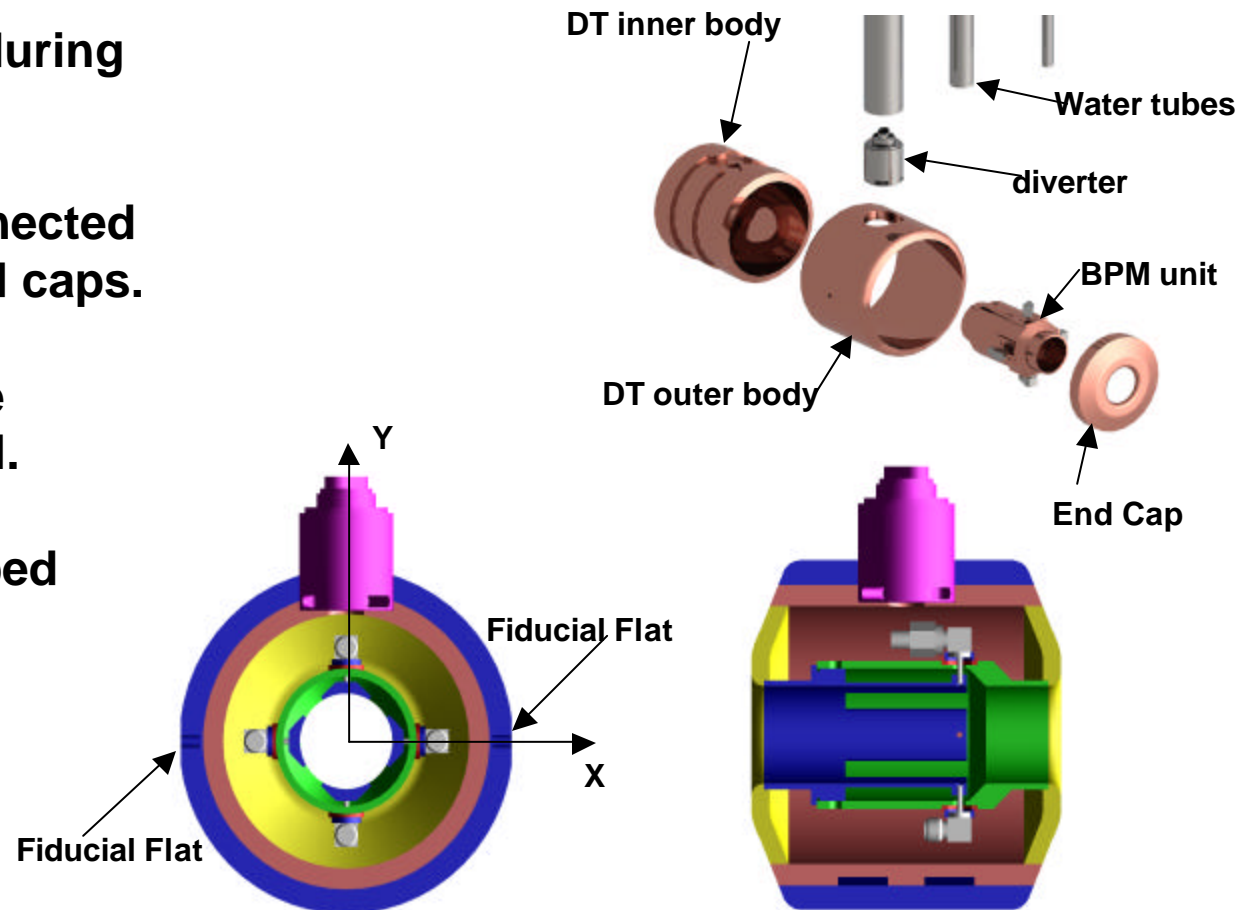
- Will allow precise beam steering through DTL
- Demanding application of BPM technology.
- 60° strip-line electrodes are flush with drift-tube ID.
- Signal from electrodes is taken out through outer cover and drift tube stem.



Precise Fabrication and Assembly Required for BPM in Drift Tube



- BPM unit is installed during drift-tube fabrication.
- Signal cables are connected prior to welding of end caps.
- Alignment pins ensure orientation of the BPM.
- The assembly is mapped using a taut-wire measurement.

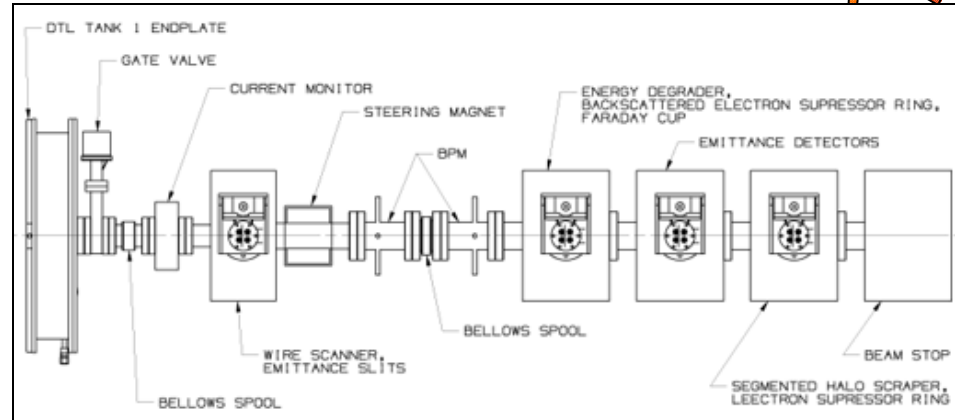


Design of Diagnostic Plate for DTL Commissioning is Underway

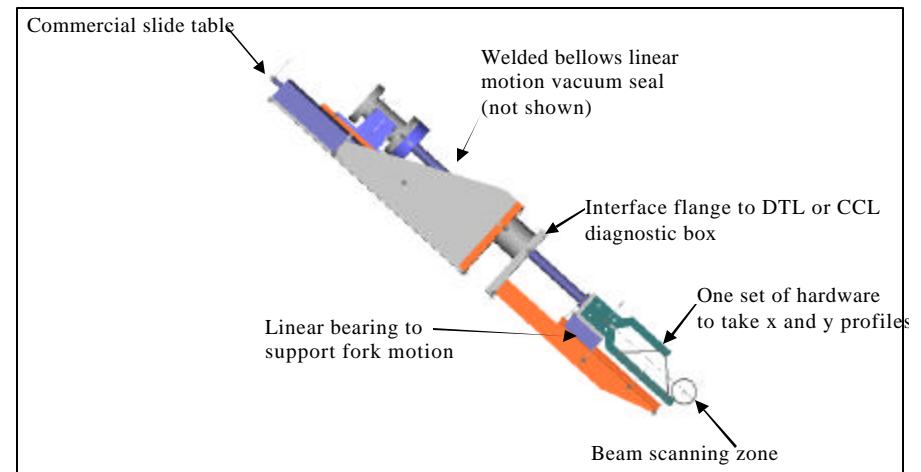


- The instrumentation is geared toward measurement of:

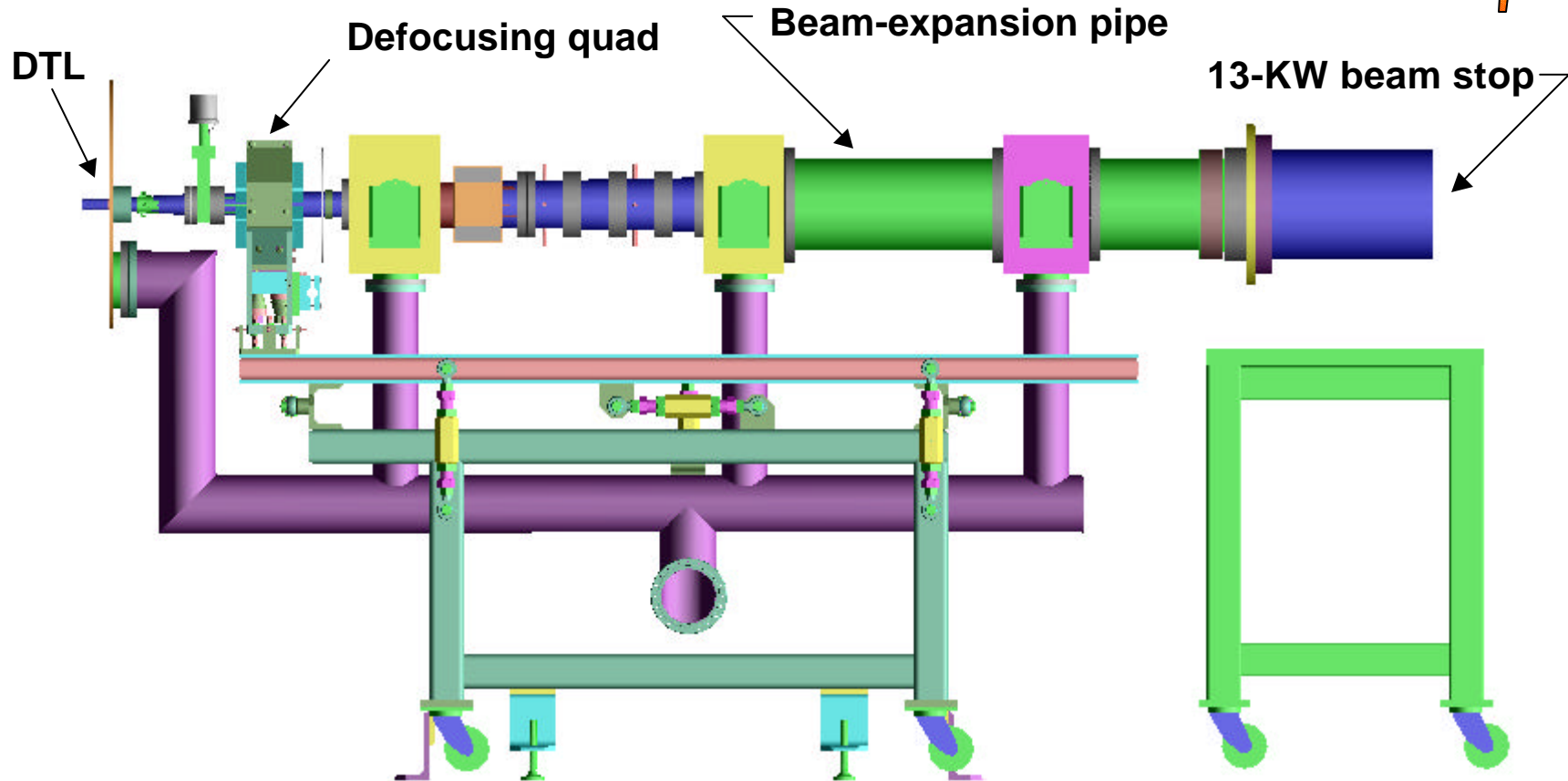
- Transmission
- Acceptance
- Phase and energy
- Transverse profile
- Transverse emittance



- Physics studies have been made of the expanding beam.
- Diagnostics designs are progressing.
- A 13-kW beam stop will handle full beam power after DTL tank 1.



The DTL Tank-1 Diagnostic Plate is in Preliminary Design

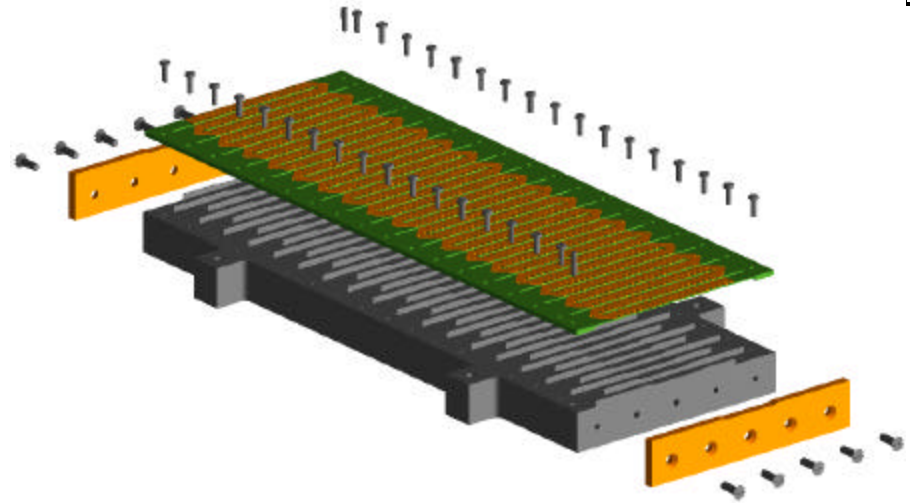


MEBT Chopper With FET Pulser Will Achieve 10-ns Risetime



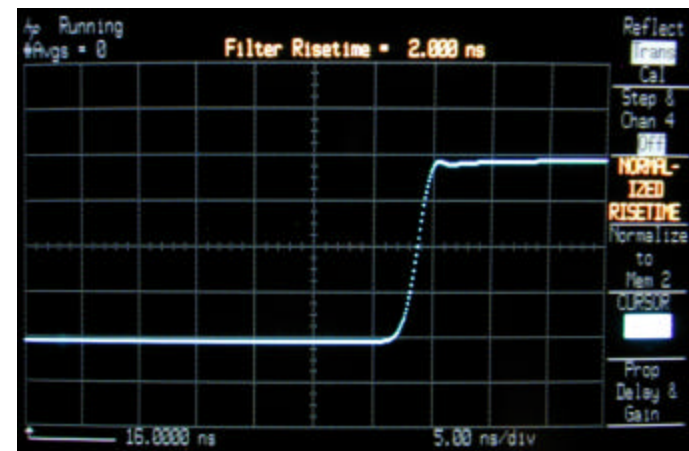
Chopper requirements:

Beam energy	2.5 Me V
Chopper length	35 cm
Chopper gap	1.8 cm
Voltage	± 2.35 kV
Deflection angle	18 mrad
Chopping period	945 ns
Rise & fall time	< 10 ns



Prototype pulser order placed

- Based on POP tested in Jan. 2000
- Positive & negative, ± 2.5 kV
- Series FETs, < 10 ns
- Delivery in March 2001



Fast Chopper in MEBT Uses New Meander-Line Structure



- Design based on notched stripline with dielectric supports and separators.
- Layout optimized with 3-D electromagnetic code MAFIA.
- Prototype measurements agree with 3-D time-domain simulations.
- Structure rise and fall times are 1 to 1.5 ns.
- Phase velocity along beam path matches MEBT velocity ($\beta = 0.073$)

